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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

WRITER'S TELEPHONE

(202) 639-6755

March 6, 1997

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, DC 20554

Re: IB Docket No. 96-220
Notice of Ex Parte Presentation

Dear Mr. Caton:

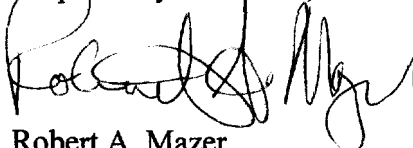
Leo One USA Corporation ("Leo One USA"), by its attorneys, hereby notifies the Commission, pursuant to Section 1.1206 of the Commission's rules, that it participated in a meeting with Commission staff concerning the above-referenced proceeding. The following members of the International Bureau staff participated:

Paula H. Ford
Julie Garcia
Harold Ng
Thomas S. Tycz

A copy of the presentation material used during that meeting is attached. An original and one copy of this notice are being submitted to the Secretary's Office. Copies of this letter are being provided to the members of the staff named above.

Any questions regarding this matter should be directed to the undersigned.

Respectfully submitted,



Robert A. Mazer
Counsel for Leo One USA Corporation

Attachment

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Starsys Interference Analysis

3/3/97

Introduction

■ Impact Of Proposed Band Sharing Settlement Plan

- ▲ Band Splits As Proposed By FACS, Starsys, Orbcomm, VITA & ESat Would Result In
 - Unworkable Interference Environment
 - More Costly Subscriber Terminals For LEO One
 - More Complicated Satellite Tasking & Coordination
 - Puts LEO One In Jeopardy Of FACS Interfering With DMSP & Shutting Down LEO One
 - Requires DoD (DMSP) To Coordinate With 2 or 3 Parties
 - Requires NOAA To Coordinate With All NVNG Systems
 - Not A Fungible Split
- ▲ LEO Ones' Proposed System A and System B Is Workable
- ▲ Shared Uplink Gateway Spectrum Will Not Work For LEO One

Geometry Of Interference Environment

- **Starsys CDA Coordination**
 - ▲ Mainbeam Interference
 - ▲ Sidelobe Interference

Interference Environment To CDMA Systems

- **Starsys CDA Coordination**
 - ▲ Mainbeam Interference
 - ▲ Sidelobe Interference

Shared Uplink Gateway Spectrum

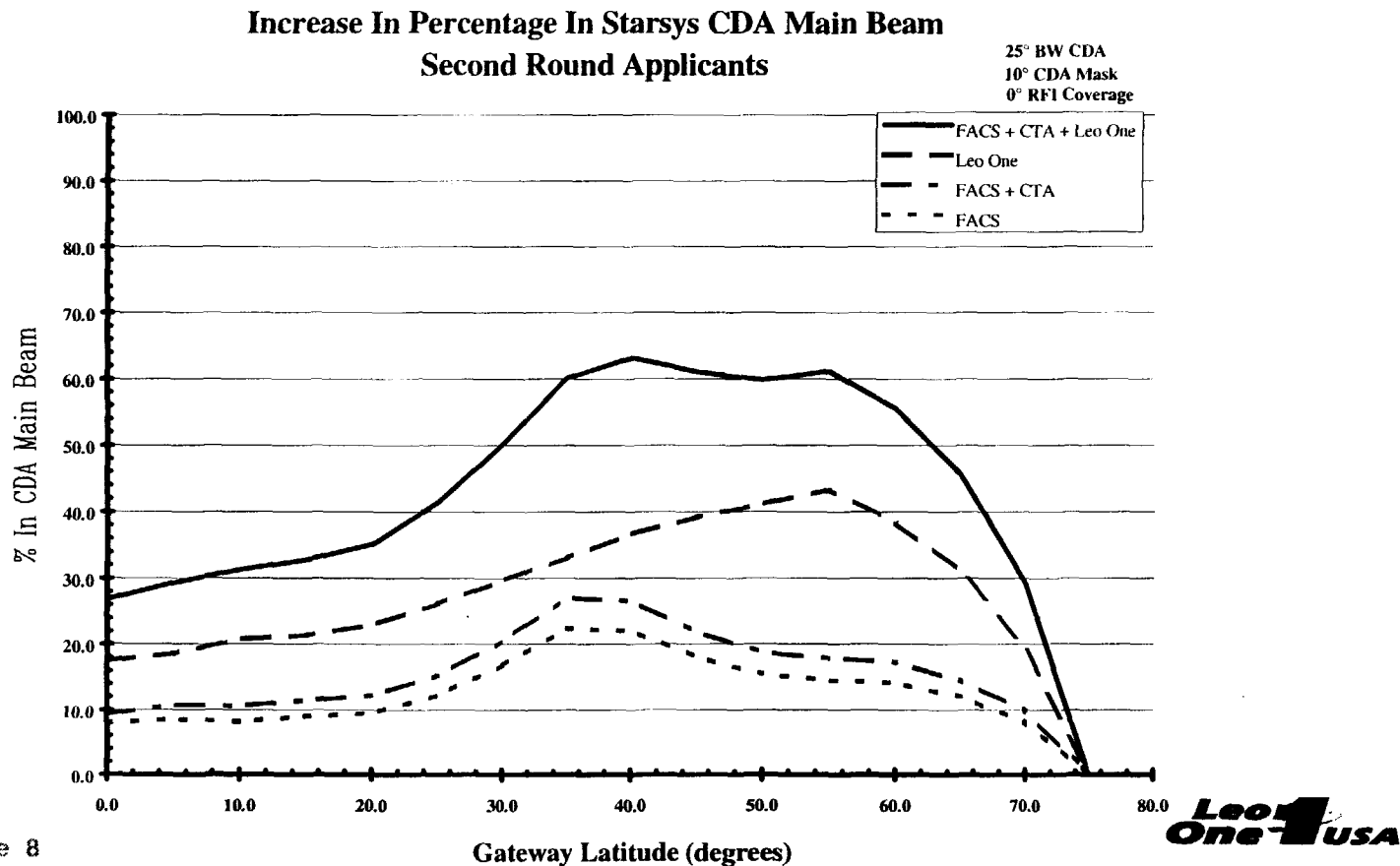
- Polarization Discrimination Does Is Not Adequate
- Geographic Separation Of Gateways Is Not Adequate

Non-Fungible Band Split

- **Band Segments Are Not Equal In Spectrum Size**
 - ▲ Proposed System X1 Spans 244 kHz at 137 MHz
 - With Orbcomm possibly sharing APT Channels (60 kHz)
 - ▲ Proposed System Y1 Spans 209 kHz at 137 MHz
 - ▲ Proposed System X2 Spans 380 kHz at 400 MHz
 - ▲ Proposed System Y2 Spans 376.7 kHz at 400 MHz
 - Encompasses VITA Channel (46.7 kHz)
- **As Previously Described The Use Of VITA Channel Is Key To High Availability In DMSP Band Utilization**
 - ▲ Only One System Can Use It
- **150 MHz Transit Uplink Band Divided In To Three 50-kHz Segments**
 - ▲ One segment shares S80 feeder link spectrum
 - ▲ 3 second round applicants plus 2 first round applicants
 - Sharing is not viable option for LEO One
 - High reliable uplink commanding feeder link is required

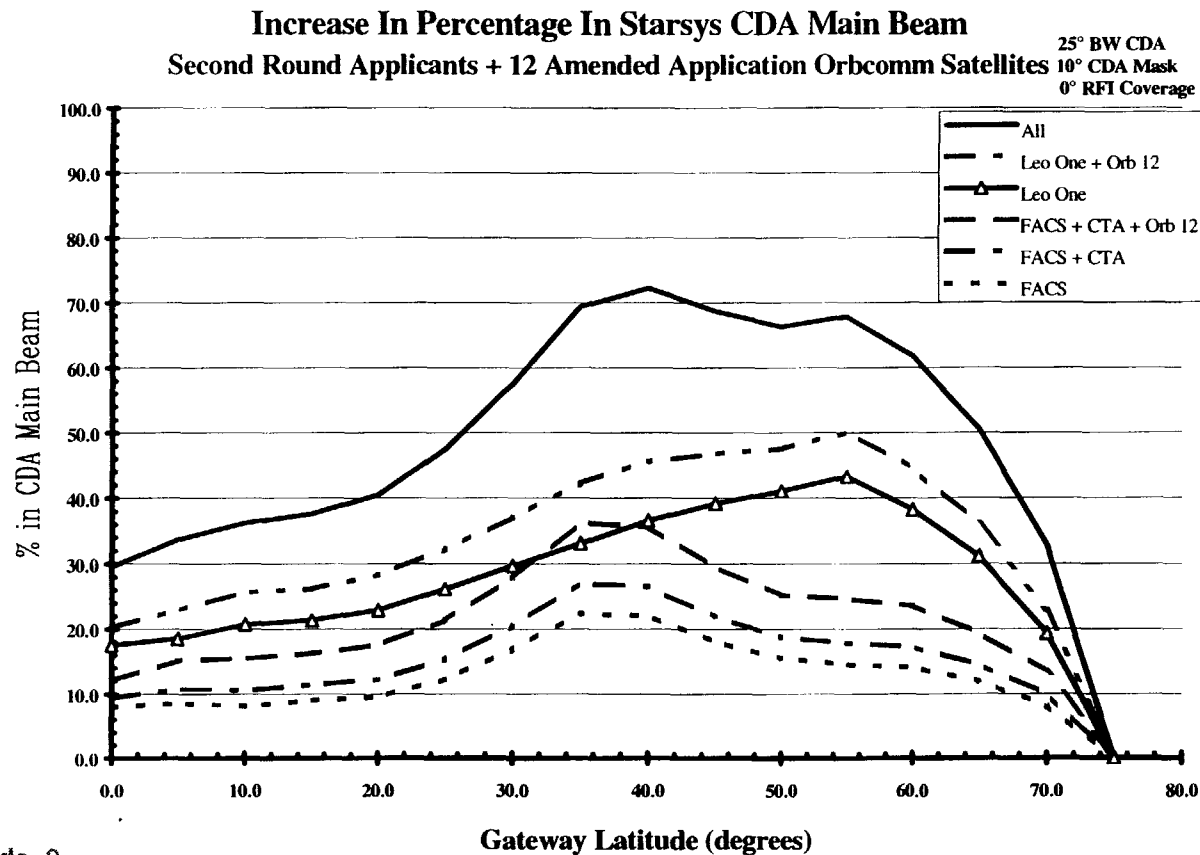
Increase in Percent Of Time At Least One Satellite In Starsys CDA Mainbeam

- At 40° N. Latitude Sharing With All Entrants Results In Interference 82% of Time
 - ▲ An Increase Of 64%
- FACS & CTA Is least Impact Addition
 - ▲ An Increase of 27% (above existing 23%)



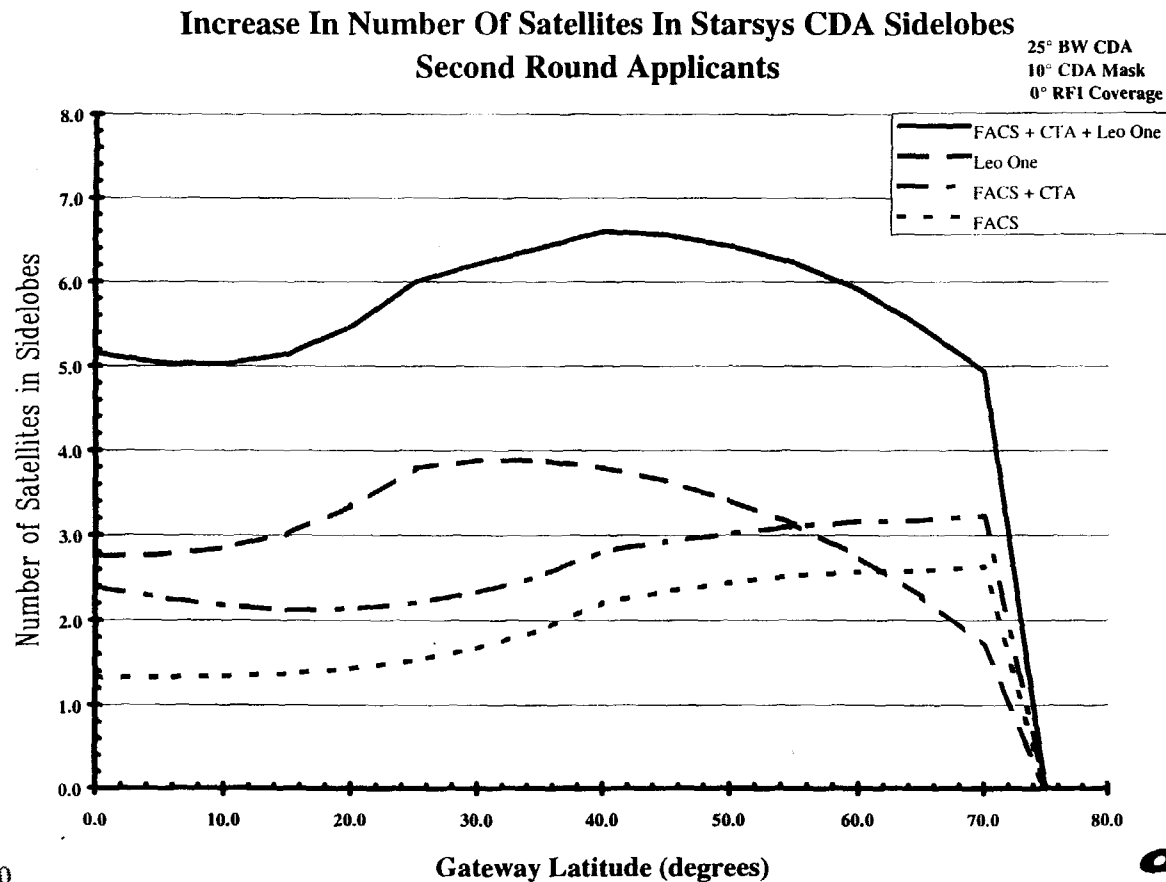
Increase in Percent Of Time At Least One Satellite In Starsys CDA Mainbeam With 12 Satellite Orbcomm Delta

- At 40° N Latitude Sharing With All Entrants Results In Interference 95.5% of Time
 - ▲ An Increase of 72%
- FACS & CTA Is least Impact Addition
 - ▲ An Increase of 36% (above existing 23%)



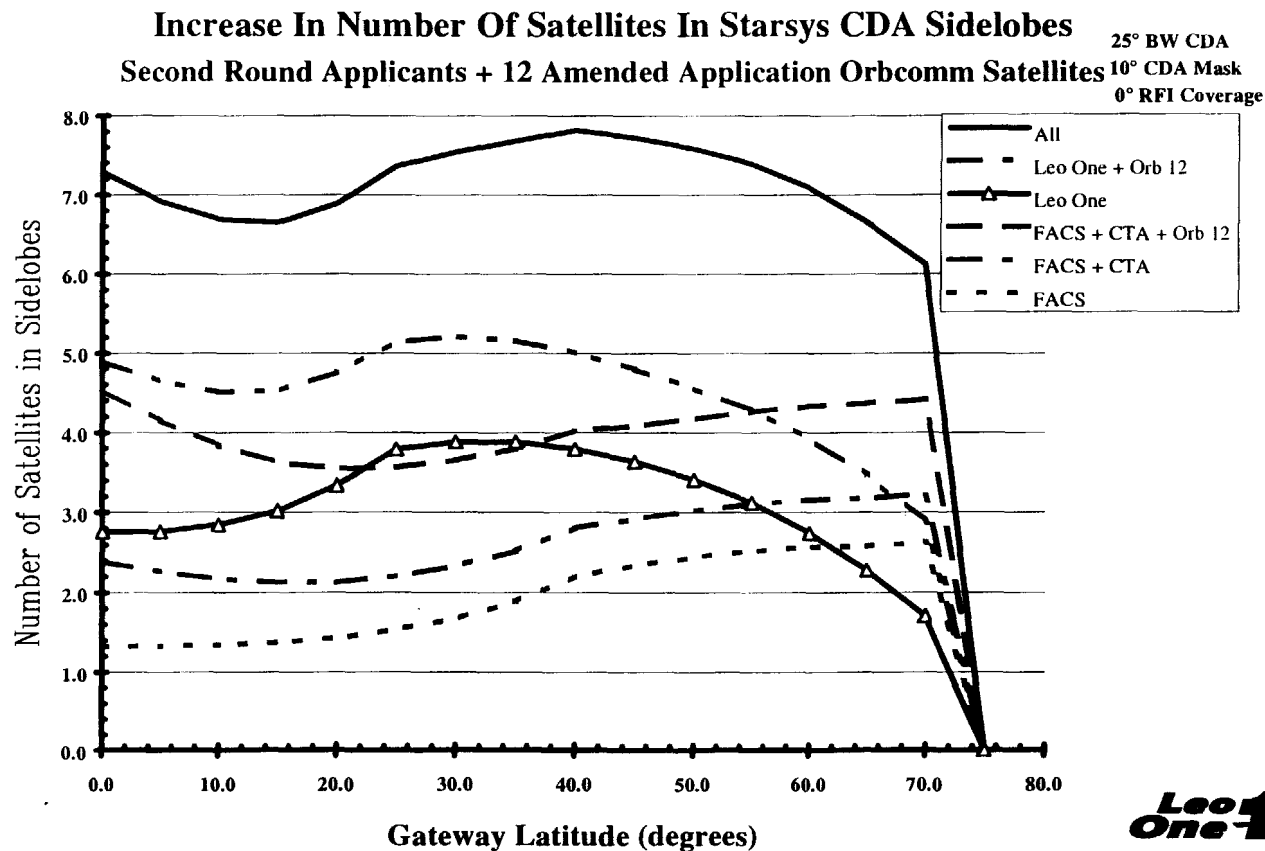
Increase in Number of Satellites in Sidelobes Of Starsys CDA Antenna

- Sidelobe Interference With All Entrants Is Average Of 9 Satellites At 40° N
 - ▲ An increase of 6.6 satellites with all second round applicants
- FACS & CTA Is Least Impact Addition
 - ▲ 2.8 additional satellites in sidelobes (5.2 satellites total)



Increase in Number of Satellites in Sidelobes Of Starsys CDA Antenna With 12 Satellite Orbcomm Delta

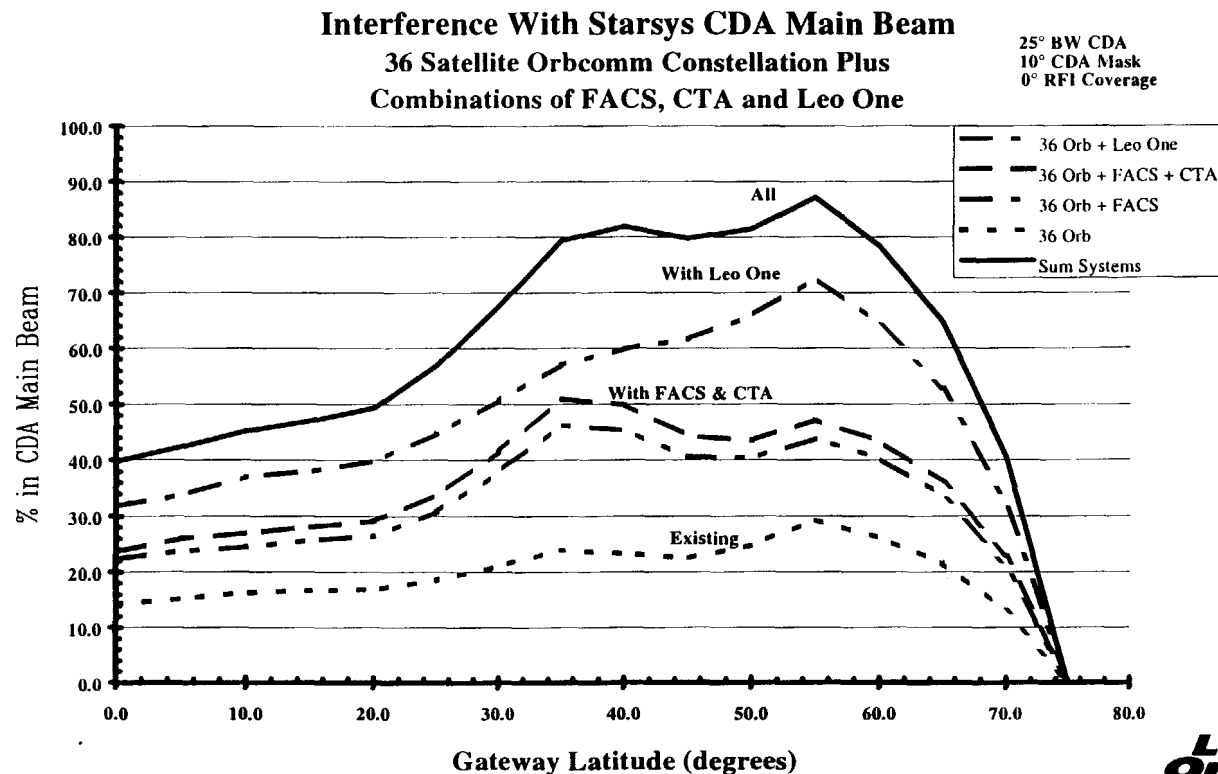
- Sidelobe Interference With All Entrants Is Average Of 10.2 Satellites At 40° N
 - ▲ An increase of 7.8 satellites with all applicants
- FACS & CTA Is Least Impact Addition
 - ▲ 4 additional satellites in sidelobes (6.4 satellites total)



Percent Of Time At Least One Satellite In Starsys CDA Gateway Mainbeam

- Band Sharing With Existing Orbcomm Constellation

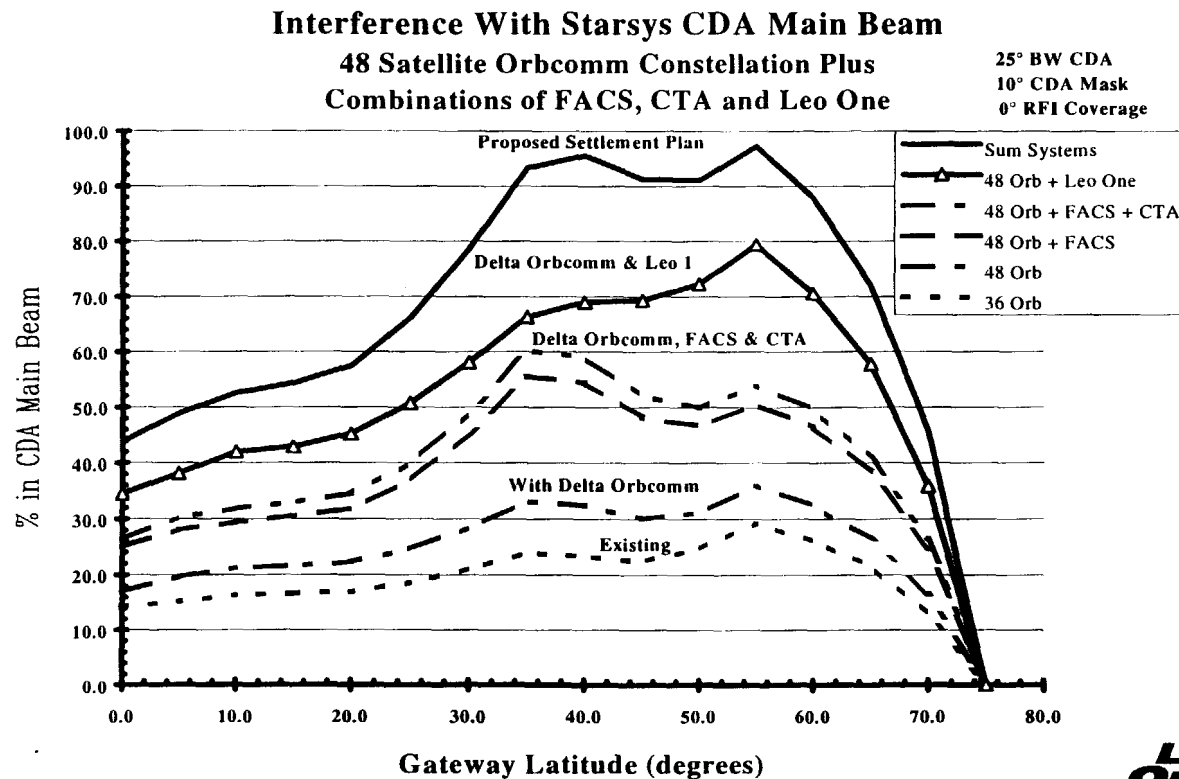
- At 40° N. Latitude Sharing With All Entrants Results in Interference 82% of Time
 - ▲ Starsys may require satellites to turn off downlinks
 - Large imposition on Near Real Time System Availability
- FACS & CTA Is least Impact Addition
 - ▲ Mainbeam interference 50% of time (An increase from 23%)



Percent Of Time At Least One Satellite In Starsys CDA Gateway Mainbeam

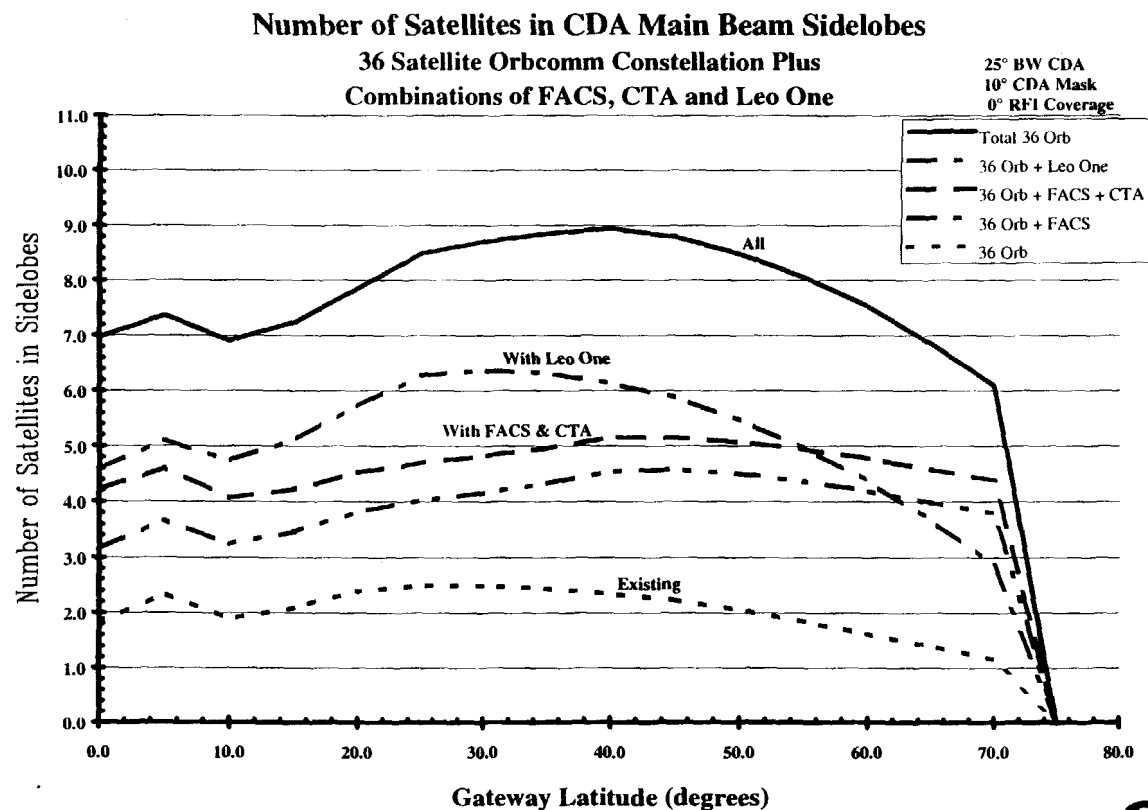
- Band Sharing With Expanded Orbcomm Constellation

- At 40° N. Latitude Sharing With All Entrants Results in Interference 95.5% of Time
 - ▲ Starsys may require satellites to turn off downlinks
 - Large imposition on Near Real Time System Availability
- FACS & CTA Is least Impact Addition
 - ▲ Mainbeam interference 58% of time With Delta Orbcomm



Number of Satellites in Sidelobes Of Starsys CDA Gateway Antenna **- Band Sharing With Existing Orbcomm Constellation**

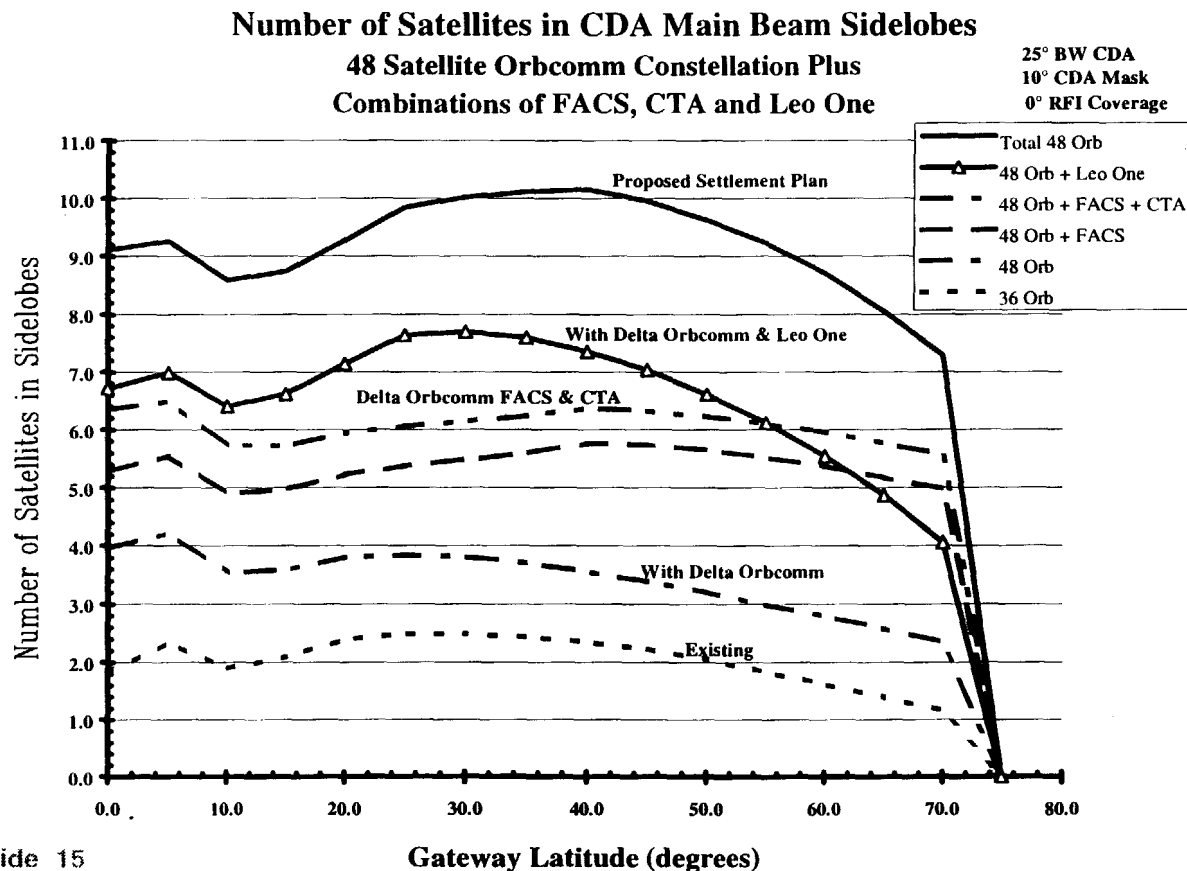
- Sidelobe Interference With All Entrants is Average Of 9 Satellites
 - ▲ At 40° N Latitude
- FACS & CTA Is least Impact Addition
 - ▲ 2.8 additional satellites in sidelobes (5.2 satellites total)



Number of Satellites in Sidelobes Of Starsys CDA Gateway Antenna

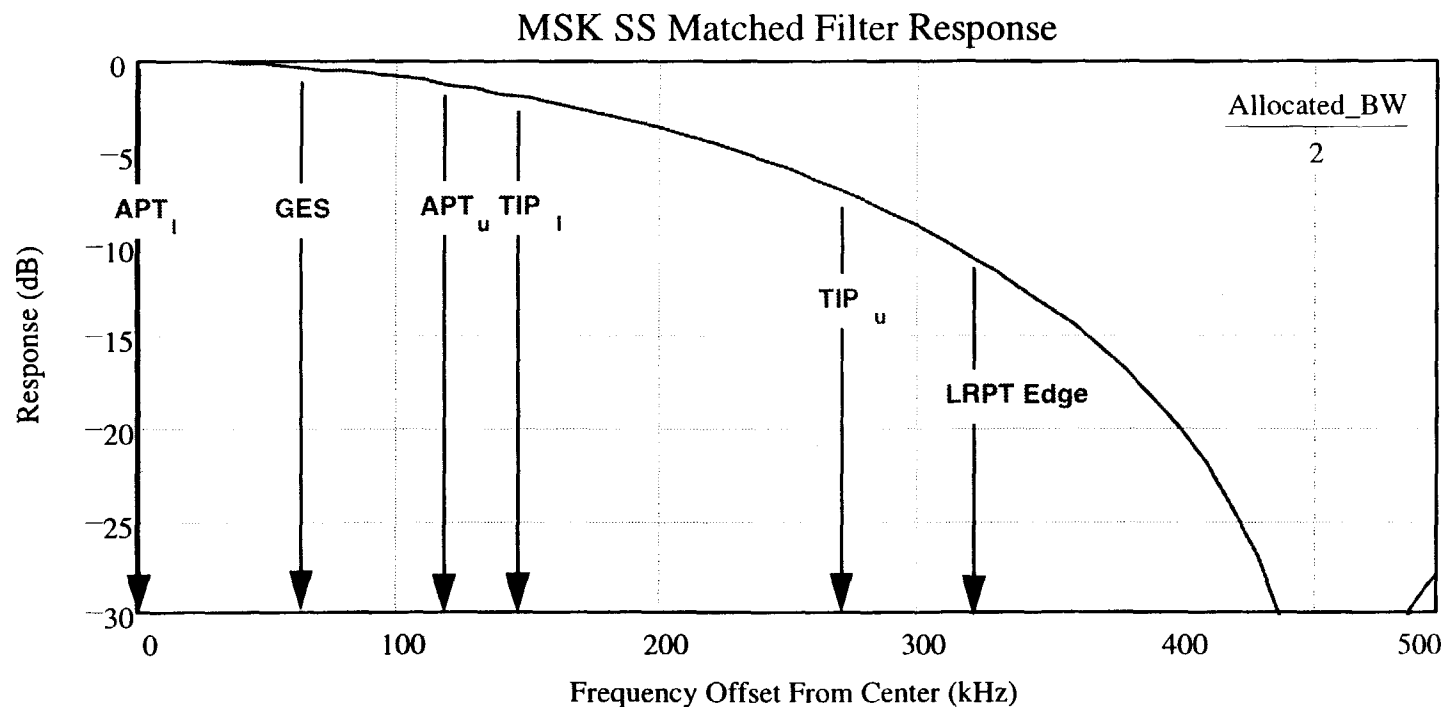
- Band Sharing With Expanded Orbcomm Constellation

- Sidelobe Interference With All Entrants is Average Of 10.2 Satellites
 - ▲ At 40° N Latitude
- FACS & CTA Is least Impact Addition with Delta Orbcomm
 - ▲ 4 additional satellites in sidelobes (6.4 total)



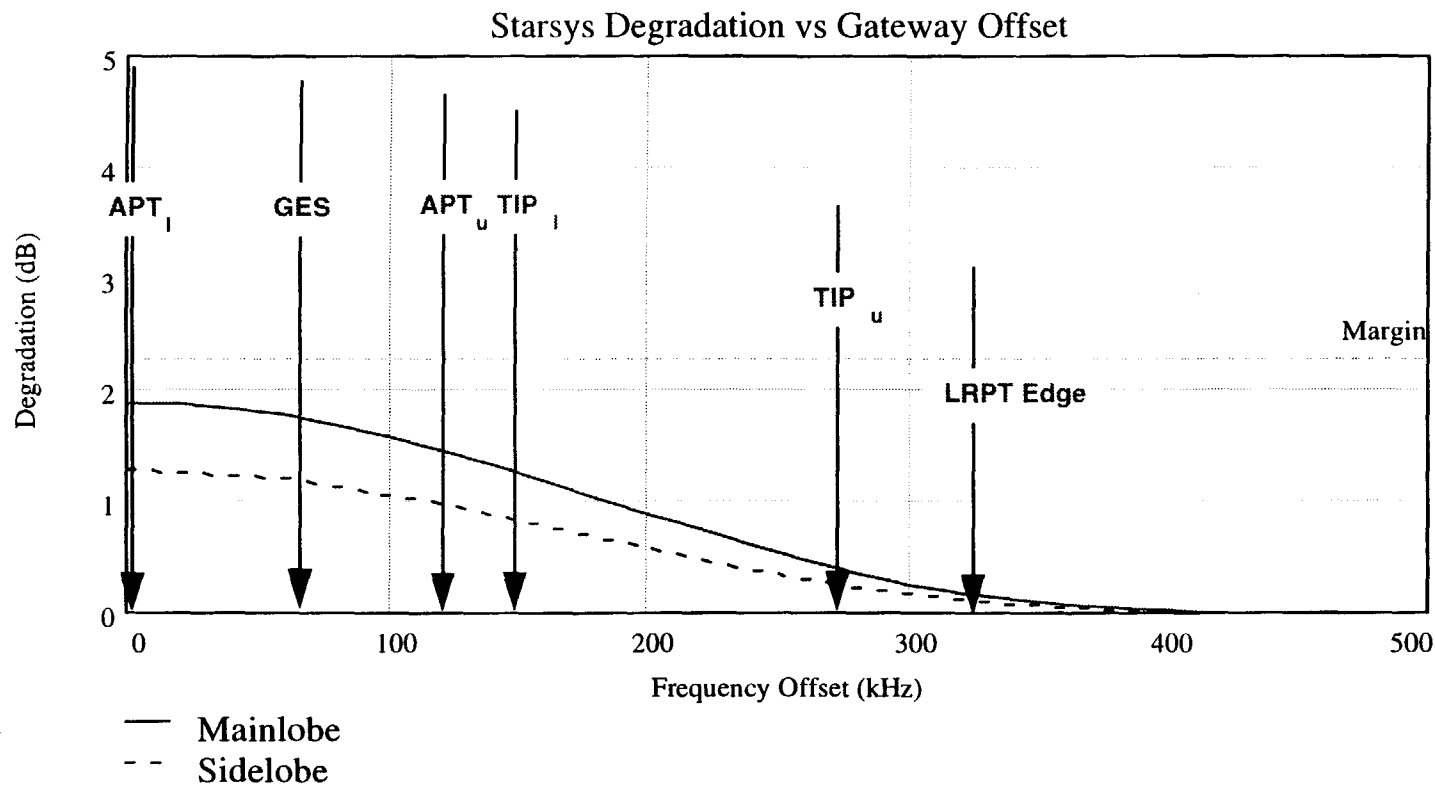
STARSYS CDMA Matched Filter Response Versus Band Allocations

- Starsys Must Accept Additional Degradation From New Entrants
 - ▲ Center APT Channel Response Is The Same As Orbcomm GES And Should Be No Different To Starsys
 - ▲ Upper & Lower APT and Lower TIP channel responses are all similar



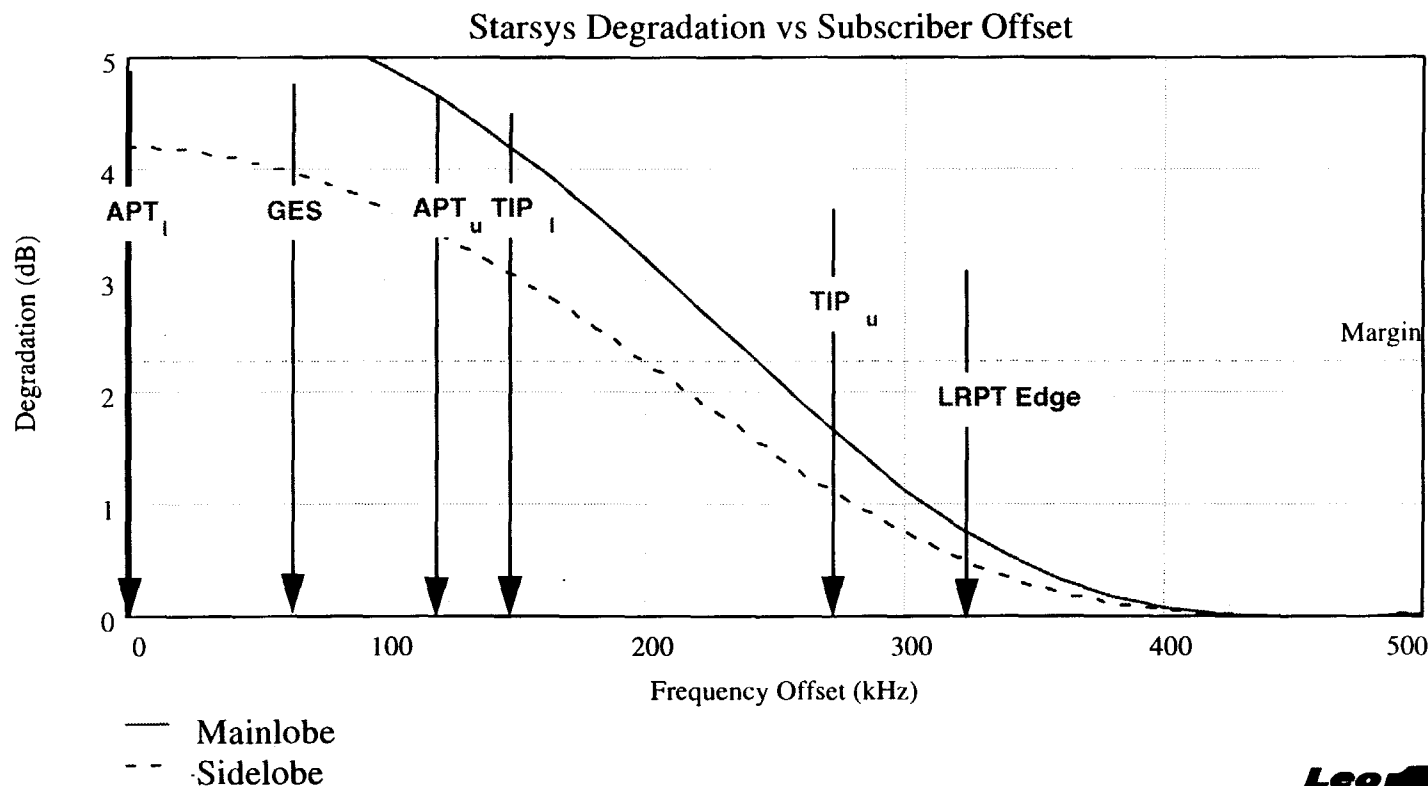
Starsys Degradation Versus Band Allocations For Gateways

- Calculation Per ITU Document 8D/TEMP/72(Rev.1)-E, 7 Nov. 1996
 - ▲ As Recommended By Starsys In NPRM Comments



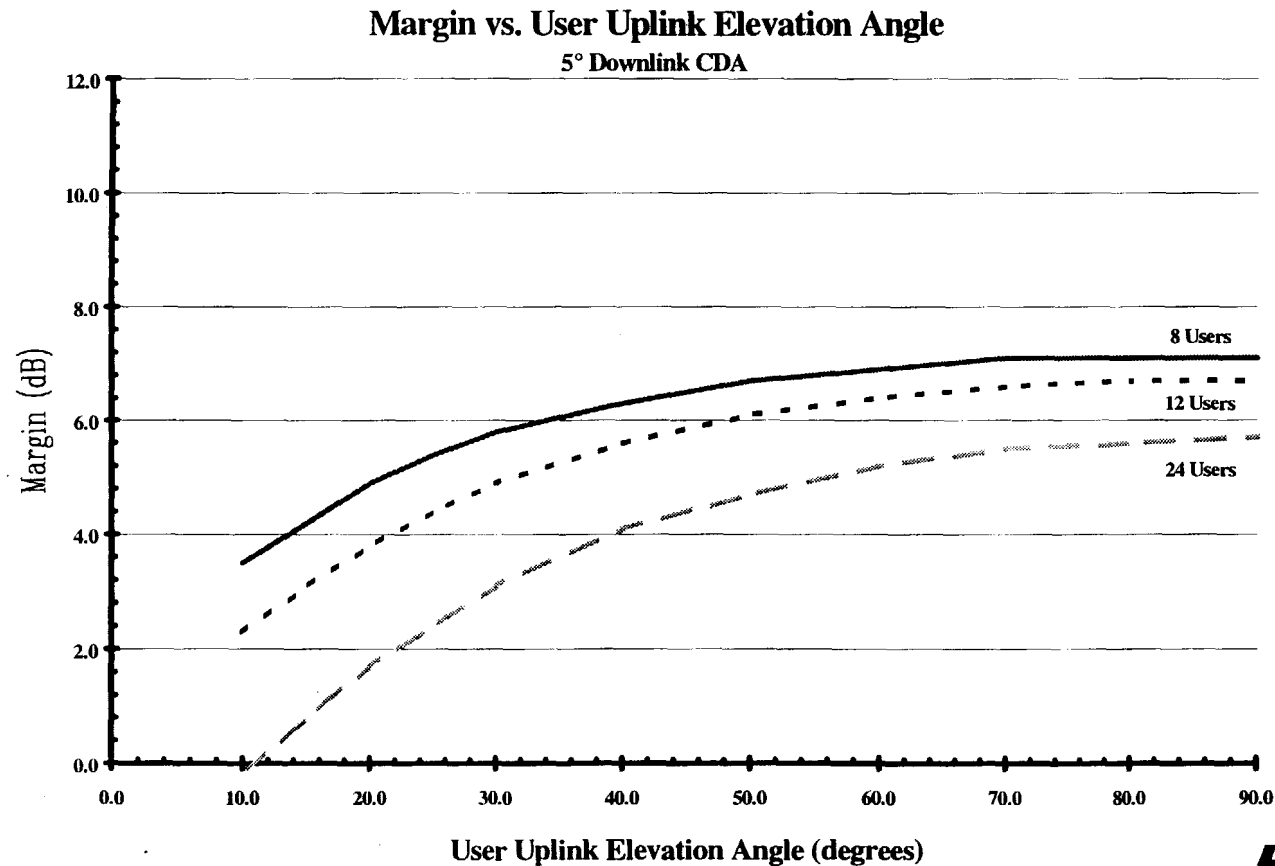
Starsys Degradation Versus Band Allocations For Subscriber Links At Max PFD

- Calculation Per ITU Document 8D/TEMP/72(Rev.1)-E, 7 Nov. 1996
 - ▲ As Recommended By Starsys In NPRM Comments
 - ▲ Subscriber Links At Max PFD Limit of -125 dB(W/m²/4-kHz)
 - ▲ Subscriber Links Fit Best In LRPT Subbands



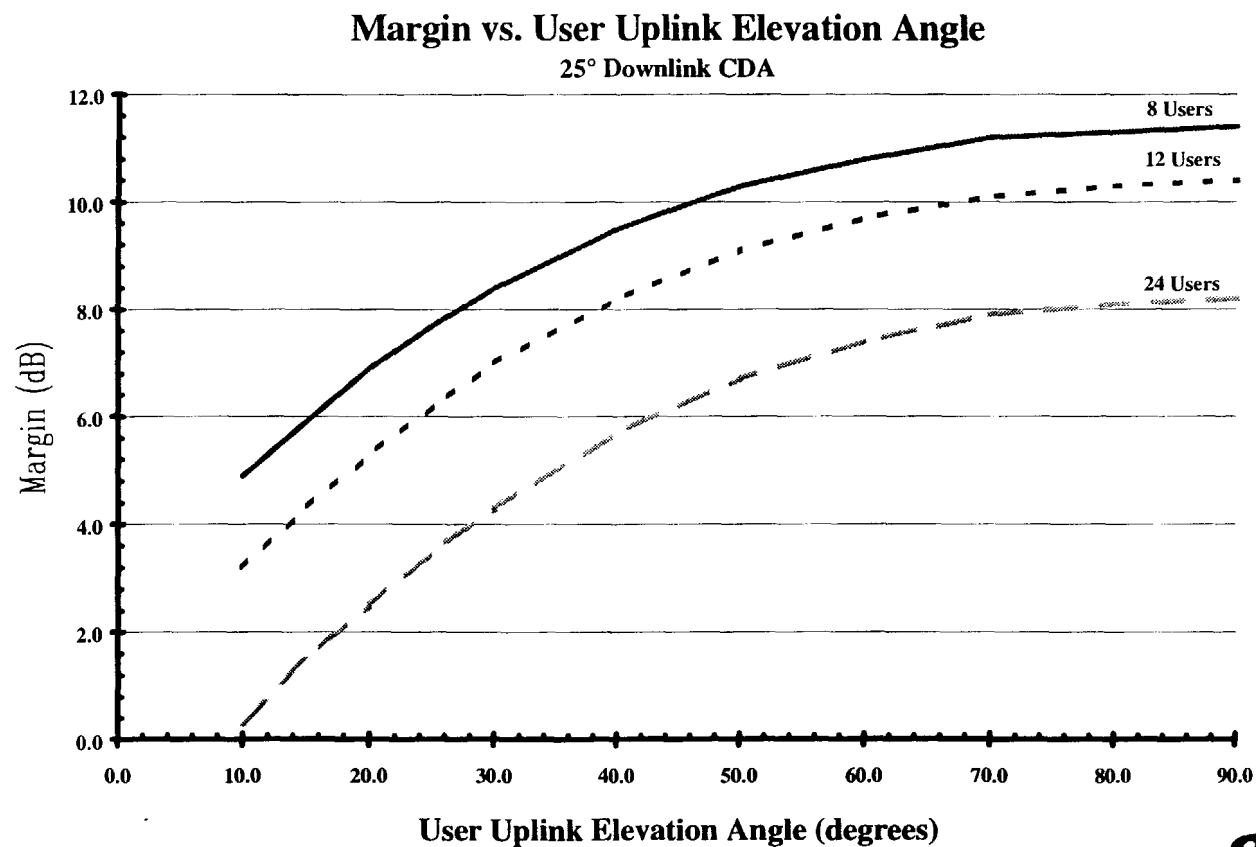
Starsys Margin At 5° CDA Elevation Angle

- 2.3 dB Link Margin at 10° User Elevation Angle Per 4/25/94 Amendment
 - ▲ Mean Margin is Stated As 8.1 dB
 - ▲ Optimum Margin is Stated As 13.2 dB
 - ▲ 12 Simultaneous CDMA Users



Starsys Margin At 25° CDA Elevation Angle (Mean)

- 2.3 dB Link Margin at 10° User Elevation Angle Per 4/25/94 Amendment
 - ▲ Mean Margin is Stated As 8.1 dB
 - ▲ Optimum Margin is Stated As 13.2 dB
 - ▲ 12 Simultaneous CDMA Users



Link Degradation Analysis Performed

- **As Per ITU Document 8D/TEMP/72(Rev.1)-E, 7 Nov. 1996**
 - ▲ Recommended by Starsys in NPRM Reply Comments (p.20)
- **Degradation computed relative to 2.4 dB margin degradation due to Orbcomm Interference Floor**
- **Gateways uniformly spread across APT, TIP and LRPT bands**
 - ▲ All identical to Orbcomm Gateway
- **Optimized for Subscribers located in LRPT bands**
 - ▲ All at -125 dB(W/m²/4-kHz)
- **Starsys calculation at worse case extreme per ITU Document**
 - ▲ 5° El on CDA downlink
 - ▲ 10° El on User uplink
 - ▲ 11 other CDMA uplink users at 25° mean elevation angle
- **Polarization discrimination included**
 - ▲ 13 dB in mainbeam of CDA
 - ▲ 8 dB in sidelobes of CDA plus sidelobe gain -15 dB relative to mainbeam

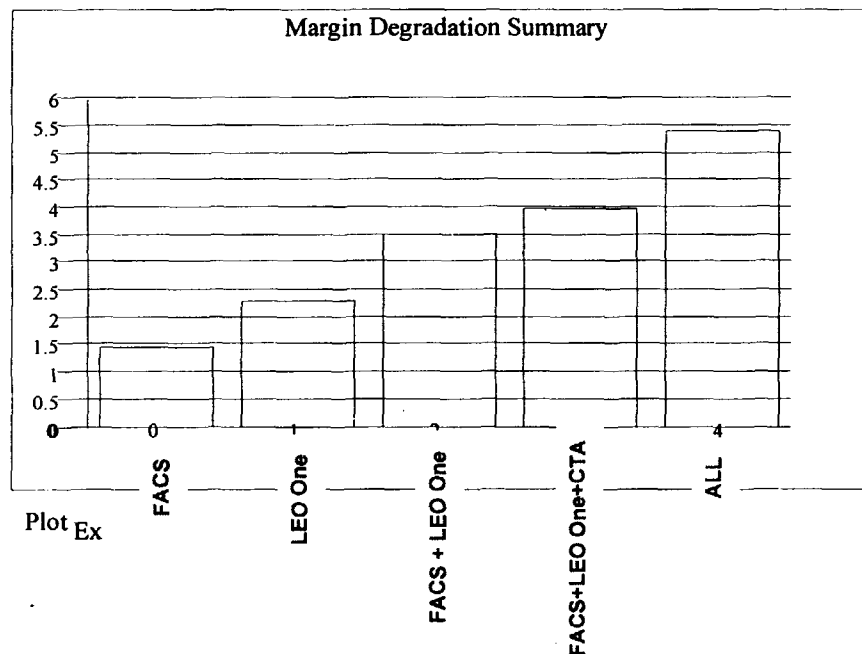
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Link Degradation Analysis Performed - Continued

- **Degradation computed for number of satellites in Mainbeam combined with number in Sidelobes**
 - ▲ One gateway and one subscriber link per satellite
 - ▲ For 40° N Latitude
 - ▲ 48-LEO One has 1.2 sats in mainbeam (for percent of time) and 3.8 average in sidelobes
 - ▲ 26-FACS has 1.1 sats in mainbeam and 2.2 in sidelobes
 - ▲ 36-Orbcomm has 1.2 sats in mainbeam and 2.3 in sidelobes
 - ▲ 12-Orbcomm has 1.0 sats in mainbeam and 1.2 in sidelobes
 - ▲ 6-CTA has 1.0 sats in mainbeam and 0.6 in sidelobes
- **Expected degradation computed for percentage of Time in CDA mainbeam shown earlier**
 - ▲ For Satellites in Mainlobe and Sidelobe
 - ▲ For Satellites only in Sidelobe

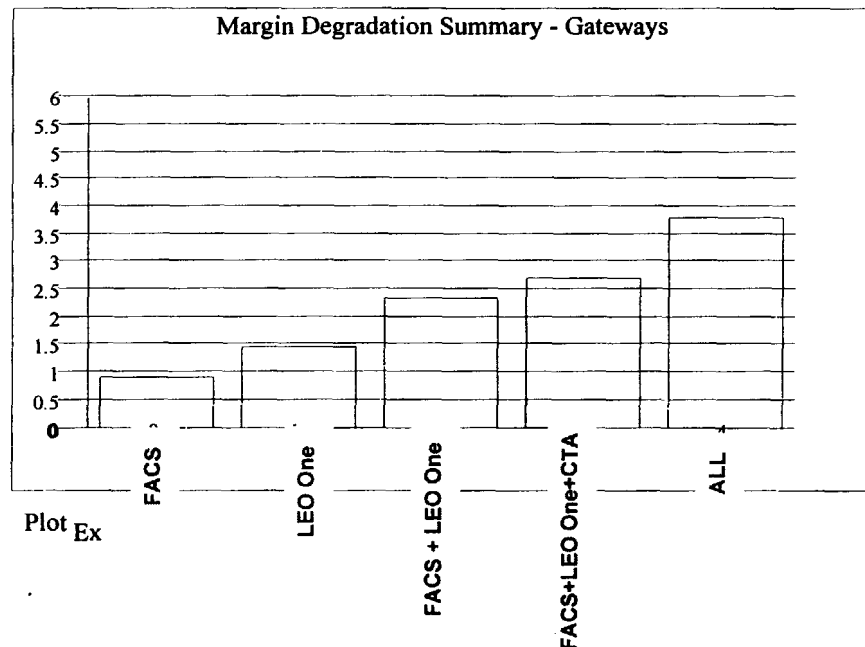
Starsys Link Margin Degradation For 137 MHz

- Analysis Shows FACS Decreases Margin By 1.4 dB
- Leo One Decreases Margin By 2.3 dB
 - ▲ 0.9 dB more than FACS
- FACS And LEO One Combined As Per Settlement Plan Decreases Margin By 3.5 dB
- The addition of Delta Orbcomm, FACS, CTA and LEO One Decreases Margin By 5.4 dB
 - ▲ Settlement plan approach



Starsys Link Margin Degradation For 137 MHz - Gateways Only

- Analysis Shows FACS Decreases Margin By 0.9 dB
- Leo One Decreases Margin By 1.4 dB
 - ▲ 0.5 dB more than FACS
- FACS And LEO One Combined As Per Settlement Plan Decreases Margin By 2.3 dB
- The addition of Delta Orbcomm, FACS, CTA and LEO One Decreases Margin By 3.8 dB
 - ▲ Settlement plan approach



VHF Downlink Sharing Analysis Conclusions

- **Proposed Settlement Plan Leads To A Significant Margin Degradation For Starsys**
 - ▲ (And S80)
 - ▲ LEO One recommends against this plan in favor of it's System B and System A presented in NPRM Comments
- **FACS Results In Less Degradation To Starsys Than LEO One**
 - ▲ FACS Is the best choice for LEO One's System B
 - CTA can be acommodated with little additional impact